

ABSTRACT

A pilot valve is disclosed. In one embodiment, it comprises: an input passageway, an output passageway, a rotatable shaft disposed between them, a permanent magnet affixed to the rotatable shaft, an electromagnet, a control element, and a failsafe magnet. The rotatable shaft has a slot that gives the rotatable shaft a varied cross-section as a function of its position. The slot is disposed to permit fluid to flow between the input passageway and the output passageway except when the rotatable shaft is in a closed position. The electromagnet is disposed to generate first magnetic field that, via the permanent magnet, drives the rotatable shaft away from the closed position. The control element places a PWM current on the electromagnet, such that the length of the duty cycle controls the strength of the first magnetic field. The failsafe magnet is disposed to generate a second magnetic field that drives the rotatable shaft away from the closed position.